Course Syllabus

Our Changing Climate: Past, Present, Future

Fall 2022

Course Number: HONR F125/NRM F125/ACNS F125

Prerequisites: Placement in WRTG F111X **Credits:** Lecture + Lab + Other: 3 + 0 + 0

Class Time and Location and associated CRN:

Online Asynchronous

• 77096 - ACNS F125

• 76920 - HONR F125

• 77069 - NRM F125

Instructors

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Course Catalog Description

Examines the intersecting physical, social, ecological, economic, political, and cultural dimensions of climate change in Alaska and the Arctic, including both Indigenous and Western science perspectives. Includes project-based experiences in observation, data collection and analysis, assessment, planning, communication to shape the future in a time of unprecedented change.

Course Purpose

This course examines how the biophysical impacts of climate change define and intersect with the social, ecological, economic, political, and cultural dimensions of our lives. We will investigate the multiple dimensions of global climate change, with a focus on the ways climate change affects the interconnected physical, biological, and human systems in Alaska and the Arctic. Through activities, guest speakers, readings, and lectures, it provides a

foundation in both Indigenous and Western science perspectives of the causes, impacts, and feedbacks of a changing climate. We will critically examine scientific claims and the processes of generating climate science, developing an understanding of the scientific method through observation, data collection and analysis. We will also explore the ways in which climate change is shaped by history and presently shapes our culture. By looking at research from communication, human behavior, and social movements, we will investigate the multiple pathways of social change, with an emphasis on our own vision and agency to shape the future in a time of unprecedented change.

Required Readings and Videos

You will be responsible for reading, watching, or listening to assigned materials prior to class on all days that readings are assigned.

The book *Saving Us: A Climate Scientist's Case for Hope and Healing in a Divided World,* by Dr. Katharine Hayhoe, is required reading for this course and available at the UAF bookstore or through major book vendors.

All other required readings and course materials will be provided through Canvas.

Learning Goals & Objectives

Course Big Idea: We can listen, inquire, observe, and act to make a difference on climate change.

Enduring Understandings:

- 1. Climate change influences each of us personally.
- 2. Climate change influences earth systems at multiple interacting scales.
- 3. Climate change influences all dimensions of our lives- social, economic, cultural, and biophysical.
- 4. We can help our communities to respond to climate change and shape the future.

Unit Level Essential Questions and Learning Objectives

Unit 1. What is our individual or personal connection to climate change and how does it connect with broader systems?

Students will be able to:

- Conduct elder visits following local protocol in a respectful manner
- Reflect on and articulate their personal observations of environmental change in place special to them
- Establish a baseline of individual and collective (i.e. across course students) prior knowledge on the topic of climate change

Unit 2. How do we know the climate is changing?

Students will be able to:

 Describe causes of climate change and key amplifying and stabilizing feedbacks (with emphasis on Arctic feedbacks)

- Identify key indicators and sources of evidence that form the baseline of evidence to understand climate change (including Indigenous and Western science knowledge)
- Collect and interpret ecological and social science data
- Understand mathematical models and projections of climate change

Unit 3. What are the impacts and feedbacks of a warming climate? Students will be able to:

- Identify reputable sources of climate change information for a region
- Articulate key changes in disturbance patterns, livelihoods, species distributions and phenology influenced by a changing climate
- Describe the interactions and feedbacks between the above changes across local to global scales, and natural and social processes.

Unit 4. What are the solutions to climate change?

Students will be able to:

- Understand that human behavior is the product of individual actions, shaped by local context
- Articulate the pathways and levers that could be used to reach drawdowns and the pros and cons of each "lever"
- Identify the pathways by which societal change occurs in the U.S.

Unit 5. How do we make decisions in the face of climate change? Students will be able to:

- Synthesize evidence to identify social and biophysical factors that influence local vulnerabilities to climate-related risks
- Take a scenario and describe the actions they would take using the RAD framework or other decision-making framework (e.g. adaptation toolkit)

Unit 6. What can I do about climate change in my community and how do we prepare for change?

Students will be able to:

- Understand and articulate a personal climate action plan
- Synthesize multiple lines of evidence to create a future scenario
- Apply theories of transformation to create a vision and action plan for the future

Our Teaching Philosophy

- Each of you brings valuable personal observations and knowledge with you to this class.
- We are partners and collaborators in the learning process, each responsible for sharing what we know with each other.
- Our job as educators is to activate your personal connection and prior knowledge and challenge each of your to continue to build your understanding, advance your ability to apply and synthesize new scientific knowledge and skills, and identify pathways to solve the problems you care about most.

- Our assignments are challenging, creative, and nurturing spaces to test your ideas and sharpen your skills. Problems like climate change never have one right solution, and you'll be assessed for engaging deeply versus finding a single, correct answer.
- We care deeply for your success in this class and beyond, and as such we expect you
 to bring equal energy to that goal, by being responsible for your own learning
 before, during, and after class.

Diversity and Inclusion

- People of color have been leaders in the movements for environmental justice and climate change, but are often not recognized for their contributions to this effort. We strive to provide opportunities to hear the voices of people of color each week of our class.
- The richness of this class would not be possible without Alaska Native Knowledge holders. We are grateful for the time they spend sharing their knowledge with us.
- We honor that students have a variety of skills, gifts, and abilities when it comes to learning, and we aim to provide resources that meet a variety of learning preferences (i.e. reading, watching, listening, experiencing, etc.)
- We acknowledge our positions of privilege as white, cis-gendered women in our society and we are actively learning and working towards creating an environment where we can listen and learn together. We aim to acknowledge and address issues of diversity, inclusion, and power within this class and the context of climate change.

Course Policies

Participation and attendance- Success in this course is dependent on your active participation and engagement. It is good practice to login to online courses several times a week to stay informed of news, announcements, grades, assignments, and other important course information and follow the suggested course workflow. Students are required to participate in course related activities that may include, but not limited to reading announcements, watching lectures, reading, participating in online class activities, and submitting assignments.

Technical Requirements - Students must have regular access to a computer and internet to access course materials on Canvas and upload assignments. We will ask you to submit videos occasionally, and so a cell phone, tablet, or web camera may be useful.

Plagiarism/Academic Integrity Policy- Acts of academic dishonesty include cheating on exams, using data or words of other students without permission, helping others to dishonesty cheat, plagiarizing, feigning illness to obtain an extension, and turning in work that was written for another class without permission. Plagiarism includes overt or covert use of other people's work, ideas or words without acknowledgement or quotation. Please read the UAF Code of Conduct in the UAF Catalog. Any person enrolled in the course who behaves dishonestly will receive an F for the class and the case will be presented to the University Disciplinary and Honor Code Committee for review.

Email Policy- In order to ensure that your email does not get sent to the spam folder, please use your University of Alaska-assigned email address for all email correspondence. We will respond to emails within 24 hours Monday thru Friday between 9 am and 5 pm. All emails sent after 5 pm on Friday will be replied to by Monday 5 pm. Please use the course number in your email subject line so that we can better identify and respond to emails regarding this class. We may not see an email that does not contain this subject line.

Late Policy- Work turned in late will have a 5% deduction in points automatically, unless otherwise communicated with the instructors. Extensions will be granted for extenuating circumstances that are clearly communicated to the instructors per the email policy above.

UAF Wide Course Policies

Disabilities Services- The Office of Disability Services implements the Americans with Disabilities Act (ADA), and ensures that UAF students have equal access to the campus and course materials. Students and the instructor of this course may work with the Office of Disabilities Services to provide reasonable accommodation to students with disabilities.

Student Protections Statement- UAF embraces and grows a culture of respect, diversity, inclusion, and caring. Students at this university are protected against sexual harassment and discrimination (Title IX). Faculty members are designated as responsible employees which means they are required to report sexual misconduct. Graduate teaching assistants do not share the same reporting obligations. For more information on your rights as a student and the resources available to you to resolve problems, please go to the following site: https://catalog.uaf.edu/academics-regulations/students-rights-responsibilities/.

Courses in the Time of COVID

These are uncertain times, and we understand that you may experience unexpected challenges during the semester. Please communicate with us if you are having challenges related to health, technology, caregiving responsibilities or work responsibilities. We know it can be difficult to ask for help, but we will find a way to help you be successful in this course while maintaining the care for yourself and your loved ones during this semester. Please email us and we will respond in accordance with the Email Policy previously stated.

We also ask you to be patient with us if there is a need to make changes to the syllabus or the weekly course plan in response to the evolving situation with COVID19. We will strive to communicate any changes to the course to you as soon and as clearly as possible.

Assignments

All assignment descriptions, grading rubrics, and due date for recurring activities are on Canvas. All assignments must be submitted on Canvas by 11:59 PM on the day they are due.

Major Assignment Name	Points	Due Date
Start of Semester Activities - Start of Semester Survey (1 point) - Meet your Classmates Discussion (2 points) - Syllabus Scavenger Hunt (2 points)	5	Due: Sept. 4
Participation, Activities and Discussion (2 points per week) Participate in discussion boards as specified in Canvas. Complete class activities used to immerse you in the lecture content beyond the major assignments.	28	as assigned
Reading Reflection (1 point each) Read assigned readings (or watch or listen to assigned video/audio) and submit a "circle-square-triangle" reading reflection.	22	as assigned
Personal Observations of Change Map Draw and annotate a map of a place you know well and the social or ecological changes you have observed in that place.	10	Due: Sept 4
Elder Visit Reflection Essay Write a brief reflection on the experience of listening to an Alaska Native elder.	10	Due: Sept 11
Personal Action Essay Choose a personal behavior to change for the semester, and write part 1 of your essay to select your action and part 2 to reflect on your experience.	Part 1: 10 Part 2: 15	Part 1 Due: Oct 2 Part 2 Due: Nov 27
Citizen Science Project Collect 3 river or lake freeze-up season observations OR make weekly observations of clouds for 3 weeks through the GLOBE Observer app. Analyze your data as a part of a global dataset at GLOBE.gov, and practice writing a scientific report on your data.	25	Observations Due: Sept. 25, Oct 2, Oct 9 Report Due: Oct 16
Climate Impacts, Feedbacks, and Solutions Presentation Research and create a presentation on an assigned climate change impact, its influence on the social or biophysical elements of a region or community, and current ideas for reducing, mitigating or adapting to the impact.	25	Due: Nov 6
Conversations with Climate Leaders Choose two experts to interview and take notes. Write a 2-3 page essay to summarize what you learned from the interviews.	25	Due: Nov 20
Final Paper/Project Write a final paper, or create a video, audio, or multimedia expression	25	Presentation Due: Dec 4

that is a "Postcard from the Future." Prepare a 5 minute in-class	
presentation about your project.	Final Paper
	Due: Dec 16

Grading Scheme:

U	
97-100%	A+
93-96%	A
90-92%	A-
87-89%	B+
83-86%	В
80-82%	В-
77-79%	C+
73-76%	C
70-72%	C-
67-69%	D+
65-66%	D
Below 65	F

Weekly Course Flow

In general, our course will follow this weekly workflow. The exceptions to this workflow are in Week 11 and Week 15, when we will share and discuss the student presentations.

	Monday	Tuesday	Wednesday	Thursday	Friday - Sunday
Student Tasks	Watch the lectures and take notes. Start on required readings.	Complete the required readings.	Participate in and complete the weekly activity or discussion forum.	If applicable, continue the activity or read and reply to your peers' posts.	Watch or read your instructor's response to the weekly discussions.
Instructor Tasks	Weekly course content will be available by 8 AM on Monday. Email an announcement introducing the week's module.			Read the posts or evaluate the activity, and clarify, correct, or ask questions as appropriate.	Post a video or written post closing out the module and signaling what is ahead. Provide feedback and grade assignments.

Course Schedule

This schedule may be subject to change.

Date	Guiding questions and Topics for week	Assignment Due by midnight Sunday
		this week
Week 1		
Aug 29-	What are we going to do in this	Watch lecture videos:
Sept 4	course?	 Welcome to Our Changing
		Climate
	What are my personal connections	Personal connections to climate
	to climate change?	change
	 Personal observations maps 	 Mapping personal observations
	 Analyzing maps, sorting by 	of change
	lenses (economic, cultural,	
	biological, hydrological, etc)	Complete reading assignments:
		 Read everything in the "Getting
		Started" module on Canvas
		 Saving Us, Chapter 2, Who I Am

		 Saving Us, Chapter 3, Who You Are
		 Complete activities: Start of Semester Survey Meet your Classmates Discussion: Read instructions and post introduction video in the discussion board. Syllabus scavenger hunt quiz Personal Observations of Change Map: Finish your map and post it to canvas. Write a short narrative or record an audio/video of your explanation of the map.
Week 2		
Sept 5 - 11	What do Alaska Native Elders say about climate change? • What other prominent issues intersect Alaska Native experience with climate change in the examples? • Learning from Elders through Project Jukebox. OPTIONAL: Zoom Class Meetup, September 7, 12:00 pm - 1:00 PM Alaska Time	Watch lecture videos: ■ Watch the assigned Elder videos and listen to recorded interviews in Canvas Complete reading assignments: ■ Read Guidelines for Respecting Cultural Knowledge by the Alaska Native Knowledge Network Complete activities: ■ Elder Visit Reflection Essay Due. 1 page minimum reflection on what the elders have shared.
Week 3		
Sept 12 - 18	 What are the causes of climate change? Flows of energy at household, national and global scales Greenhouse effect Climate vs. weather/weather cycles Simulation 	 Watch lecture videos: Causes of climate Change How do we know the climate is changing? Why should we trust this evidence? Why We Should Trust Science Most of the Time by Naomi Oreskes Complete reading assignments:

What are the main lines of evidence that climate is changing? Why should we trust this evidence?

https://gml.noaa.gov/ccgg/trends/hist ory.html

- Paleorecords of climate change
- Indigenous Knowledge
- Keeling curve
- Climate change indicators (sea ice, phenology, pollen records, tree rings
- Feedback loops

- Saving Us, Chapter 4 The Facts are the Facts
- Saving Us, Chapter 8- A Faraway Threat
- Saving Us, Chapter 9- Here and Now
- Read Chapter 2, Key Message Sections 1, 2, and 10 of the 4th National Climate Assessment

Complete activities:

• Climate Change Scientific Consenus Activity

Week 4

Sept 19 -25

How are biophysical climate change data collected?

- Framing the questions
- Study design (experimental vs. observational, controlling for bias)
- Introduce GLOBE monitoring project, data collection and report

How is biophysical data analyzed and modeled in climate change research?

- Making sense of data
- Where do trendlines come from?
- How is variation described?
- What is a climate model?

Watch lecture videos:

- How are biophysical data related to climate change collected
- Modeling in climate change research

Complete reading assignments:

- Read <u>"Science isn't just for Scientists we can all take part"</u>
 by Madeline Ostrander
- Read "How reliable are climate models?"
- Watch embedded videos in <u>https://skepticalscience.com/climate-models.htm</u>

Complete activities:

- Make a GLOBE Observer cloud or freeze-up observation using the app
- Card deck model activity

Week 5

Sept 26-Oct 2 What do we need to do in the atmosphere to solve climate change? What are the solutions to climate change? • Greenhouse gases and residence times • Future climate scenarios and associated impacts • The carbon budget, the emissions gap, and timeline for action • Overview of climate change solutions

Watch lecture videos:

- What do we need to do in the atmosphere to solve climate change?
- What are the solutions to climate change?

Complete reading assignments:

- Saving Us, Chapter 10, No Time to Waste
- Saving Us, Chapter 13, Carbon and the Common Good
- Saving Us, Chapter 17, Time to Speed Up

Complete activities:

- Discussion related to Project Drawdown solutions
- Personal Action Essay Part 1 due
- Make a GLOBE Observer freeze-up or cloud Observation

Week 6

Oct 3 - 9 What needs to happen in policy to limit global warming?

- Solutions that reduce the sources of greenhouse gases
- Solutions that enhance Earth's natural carbon sinks
- Spheres of influence
- Co-benefits
- Major climate policies
- EN-ROADS simulation

Watch lecture videos:

- Reducing Sources by Project Drawdown
- Supporting Sinks and Improving Society by Project Drawdown
- Spheres of influence and climate change solutions
- Co-benefits of solving climate change
- Major climate policy proposals
- Preparing for the EN-ROADS activity

Complete reading assignments:

- Saving Us, Chapter 14, The Climate Potluck
- Saving Us, Chapter 15, Everyone Needs Energy
- Saving Us, Chapter 16, Cleaning Up Our Act

		Complete activities: ■ EN-ROADS Simulation: conduct a climate change solutions simulation ■ Make a GLOBE Observer freeze-up or cloud observation
Week 7		
Oct 10 - 16	What does it mean to adapt to climate change? Climate change adaptation concepts Putting adaptation concepts into practice How do we make decisions in the face of climate change? RAD decision making framework with Dr. John Morton Discussion of Citizen Science data project data analysis OPTIONAL: Zoom Class Meetup, October 12, 12:00 pm - 1:00 PM Alaska Time	 Watch lecture videos: What does it mean to adapt and build resilience to climate change? ANTHC Newtok relocation case study Resist-Adapt-Direct guest lecture Citizen science data project analysis tutorial Complete reading assignments: Read As Warming Alters Alaska, Can a Key Wildlife Refuge Adapt? by Miranda Weiss Read Fourth National Climate Assessment - Ch. 28 Reducing Risks Through Adaptation Actions
		Complete activities: ■ Citizen Science data project report due
Week 8		
Oct 17 - 23	How does climate change interact with existing inequities? • Equity and justice in climate change mitigation and adaptation • Alaska context, ANCSA, and responding to climate change How can our engagement and collaboration around climate change be more equitable?	 Watch lecture videos: Equity and justice dimensions of climate change Watch a short video about ANCSA by Kendra Remsen Watch This Is The Story Of Alaska Natives' Fight For Their Land by Al Jazeera News Complete reading assignments: Read Guiding Principles for

	Respectful engagement in climate change responses	Communities 2020 by Darcy Peter • Unequal Impact: The Deep Links Between Racism and Climate Change by Beth Gardiner • Read 'What choice do we have?' As the Arctic warms, Alaska Inupiat adapt by Jenna Kunze • Read Understanding Our Environment Requires an Indigenous Worldview by Raychelle Daniel
		Complete activities: ■ Have 2 interviews scheduled for for the climate conversation project
Week 9	IMPACTS and FEEDBACKS	
Oct 24 - 30	How is the marine environment changing? Ocean Temperature Ocean Acidification, Sea level rise, Marine life How is the hydrosphere changing? Deeper dive into precipitation change (timing, type) Changes in rivers and lakes (dissolved oxygen, temperature, ice seasonality) How is the biosphere changing? Phenology shifts Changes in biodiversity (range shifts, biological invasions, etc.) Changes in primary production (greening and browning) and feedbacks to climate system	 Watch lecture videos: How is the Atmosphere changing? Droughts and floods The Ocean Overview The Ocean- haloclines and circulation The Land - Terrestrial Ecosystems The Land - Vegetation The Land - Wildfire Complete reading assignments: No reading assignments this week. Complete activities: Continue conducting your research and working on your Climate Impacts and Feedbacks presentation. Make progress on interviewing two people for the climate

	OPTIONAL: Zoom Class Meetup, October 26, 12:00 pm - 1:00 PM Alaska Time	
Week 10		
Oct 31 - Nov 6	How is the pedosphere changing?	Watch lecture videos: Permafrost - What is it? Permafrost 1 & 2 Thawing Permafrost Terrestrial Snow Cover Glacial Ice Sea Ice How climate affects community health Complete reading assignments: Saving Us, Chapter 11, The Sickness and the Cure Complete activities: Upload your Climate Impacts and Feedbacks presentation to Canvas. Make progress on interviewing two people for the climate conversation project
Week 11		
Nov 7 - 13 Week 12	Climate Impacts and Feedbacks Student Presentations	 Watch lecture videos: Watch all of your classmates presentations. Complete reading assignments: No reading assignments this week. Complete activities: Ask questions and discuss in the discussion board. Make progress on interviewing two people for the climate conversation project

Nov 14 -What do Americans think and feel Watch lecture videos: 20 about climate change? How are they • What do Americans think about acting in response? climate change? • How do we know what people How do human thoughts, think about climate change? feelings and behaviors relate to • Meet the Global Warming's Six climate change? **Americas** Thoughts, feelings, and Complete reading assignments: behaviors and why they matter Saving Us, Chapter 1, Democrats Strategies for talking with and Dismissives Saving Us, Chapter 5, The anyone about climate change **Problem with Facts** Saving Us, Chapter 6, The Fear Factor Saving Us, Chapter 7, The Guilt Complex Saving Us, Chapter 12, Why We **Fear Solutions** Saving Us, Chapter 20, Why **Talking Matters Complete activities:** • Conversations about climate change discussion board Conversations with Climate Leaders Essay Due Week 13 Nov 21 -Can our personal actions help Watch lecture videos: 27 address climate change? How can we Individual actions and climate scale up collective action? change • What is the role for individual How individual actions affect action in our climate future? other levels • How do personal actions Building power with social connect to broader changes in movements society? Capacities of social movements What is a collective action, and Designing a campaign and how do we generate political example case study power? Social movements and climate Complete reading assignments: Saving Us, Chapter 18, Why You change Matter OPTIONAL: Zoom Class Meetup, Saving Us, Chapter 19, What I

Do

November 23, 12:00 pm - 1:00 PM

Alaska Time

		 Read A Field Guide for Transformation by Leah Caramore Stokes Read The 25% Tipping Point New research reveals how to make social change by Tracy Matsue Loeffelholz Read Beyond Coal, by Mary Anne Hitt Complete activities: Personal Action Essay Part 2 Due Movement building activity
Week 14		
Nov 28 - Dec 4	How do we find hope and courage to solve the climate crisis? • Discuss hope and courage Course wrap up: • Revisit the guiding questions for the course • Summarize what we have learned (Jamboard activity)	 Watch lecture videos: Hope and courage in the climate crisis Complete reading assignments: Saving Us, Chapter 21, Bond, Connect, and Inspire Saving Us, Chapter 22, Finding Hope and Courage Complete activities: Summarize what we learned Jamboard Upload Postcard from the Future Final Presentation to Canvas Complete course evaluations
Week 15 8	k Final Exams Week	
Dec 5 -	Final Student Presentations:	Watch lecture videos:
11	Postcards from the Future	Watch all of your classmates' presentations.
		 Complete reading assignments: No reading assignments this week.
		Complete activities:

	 Ask questions and discuss on the discussion board. Final paper due on the last day of finals, Friday, Dec. 17.
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